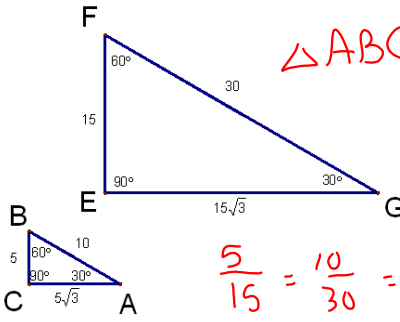
6-3 Use Similar ~ Polygons

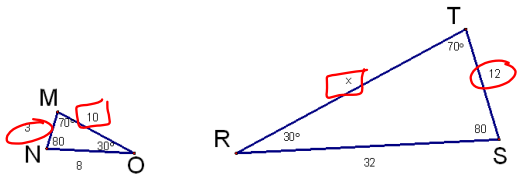
Two polygons are ~, if
1. corresponding ∠s are ≅
2. corresponding sides are proportional



△ABC ~ △GFE

$\frac{5}{15} = \frac{10}{30} = \frac{5\sqrt{3}}{15\sqrt{3}}$

Scale factor $\frac{1}{3}$



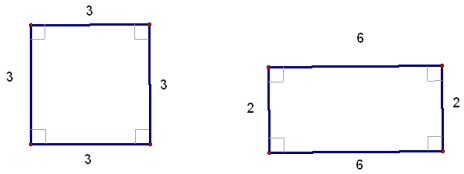
△MNO ~ △TSR

Scale Factor $\frac{3}{12} = \frac{1}{4}$

$\frac{1}{4} = \frac{10}{x}$

$40 = x$

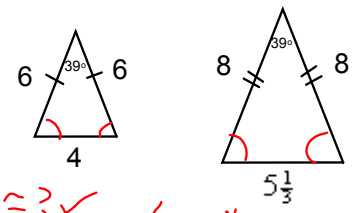
Are the following figures similar?



Angles ≅? ✓

Sides prop? no $\frac{3}{2} \neq \frac{3}{6}$

Are the following figures similar?

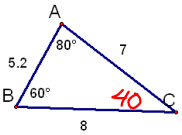


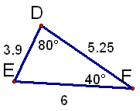
$\angle s \cong ?$ ✓

$\frac{6}{8} = \frac{4}{5\frac{1}{3}}$ ✓

yes

Are the following figures similar? S. F. 4:3





$\angle s \cong ?$ ✓

$\frac{5.2}{3.9} = \frac{7}{5.25} = \frac{8}{6}$

$1.\overline{3} = 1.\overline{3} = 1.\overline{3}$

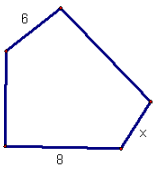
Perimeters?

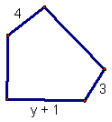
$P = 20.2$

$P = 15.15$ $= 1.\overline{3}$

Theorem 6.1--Perimeters of Similar Polygons--If 2 polygons are similar, then the ratio of their perimeters is equal to the scale factor.

The pentagons are similar.
Solve for x and y.





Board error

$\frac{3}{2} = \frac{x}{3}$

$x = 4\frac{1}{2}$

S.F. 6:4 (3:2)

$\frac{3}{2} = \frac{8}{y+1}$ $y = 4\frac{1}{3}$

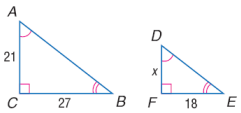
The perimeter of the larger figure is 36 units.
What is the perimeter of the smaller?

$\frac{3}{2} = \frac{36}{P}$

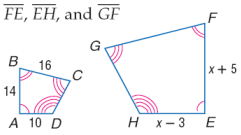
$P = 24$ units

Each pair of polygons is similar. Write a similarity statement, and find x, the measure(s) of the indicated side(s), and the scale factor.

6. $\overline{DF}$



7. $\overline{FE}$, $\overline{EH}$, and $\overline{GF}$



$\triangle ABC \sim \triangle DEF$

$\frac{21}{x} = \frac{27}{18}$

$x = 14$

S.F. $\frac{3}{2}$ $DF = 14$

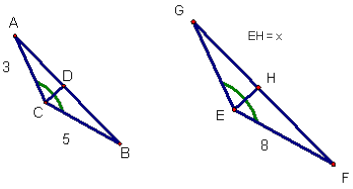
$ABCD \sim EFGH$

If 2 polygons are similar, then the ratio of any 2 corresponding lengths in the polygons is equal to the scale factor.
e.g. altitudes, medians, angle bisectors

$\Delta ABC \sim \Delta GFE$ What is EH?

$\frac{5}{8} = \frac{3}{x}$

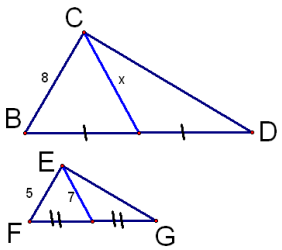
$x = 4.8$



$\Delta BCD \sim \Delta FEG$

What is the scale factor?

What is the value for x?

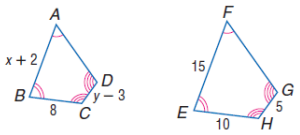


$\frac{8}{5} = \frac{x}{7}$

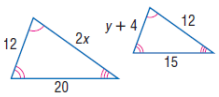
$x = 11.2$

Each pair of polygons is similar. Find x and y. Round to the nearest hundredth if necessary.

36.



38.



HW
p376-377
#s 3, 6-12, 19, 20, 23-26